

WL2831

500mA ,Ultra Low Drop-Out, CMOS LDO With BIAS Supply

Descriptions

The WL2831 is a high accuracy, low noise, high speed, low dropout CMOS Linear regulator with high ripple rejection. It is equipped with NMOS pass transistor and a separate bias supply voltage (V_{BIAS}). The devices offer a new level of cost effective performance in cellular phones, laptop and other portable devices.

The WL2831 are available in fixed output voltages between 0.8V and 3.3V, and capable of driving up to 500mA. Other features include over temperature protection and over current protection.

The WL2831 regulators are available in DFN1212-4L Package. Standard products are Pb-free and Halogen-free.

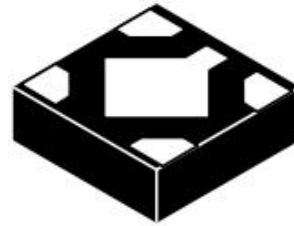
Features

- Input voltage : 0.8V~5.5V
- Bias voltage : 2.4V~5.5V
- Output range : 0.8V~3.3V
- Output current : 500mA Typ.
- PSRR : 80dB @ 1kHz
- Low Noise : 20uVrms(10Hz to 100kHz)
- Dropout voltage : 150mV @ $I_{OUT}=500mA$
- Quiescent current : 60µA Typ.
- Shut-down current : < 1.0µA
- Recommend capacitor : 2.2uF

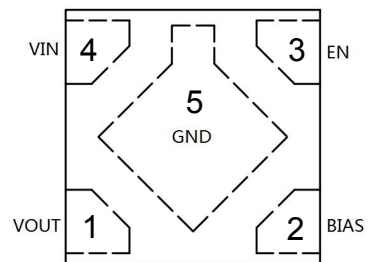
Applications

- MP3/MP4 Players
- Cellphones, radiophone, digital cameras
- Bluetooth, wireless handsets
- Others portable electronics device

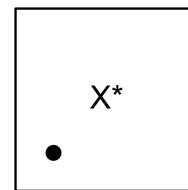
<https://www.ovt.com/>



DFN1212-4L



Pin Configuration (Top View)



X: Voltage Code

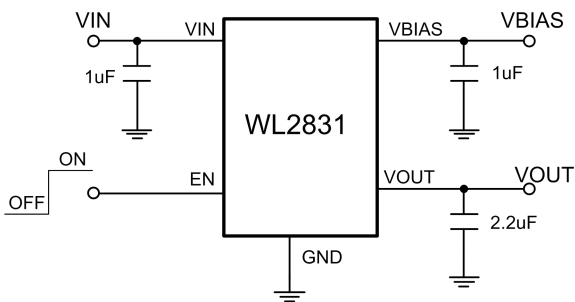
*** : Month Code**

For detail marking information, please see page 9.

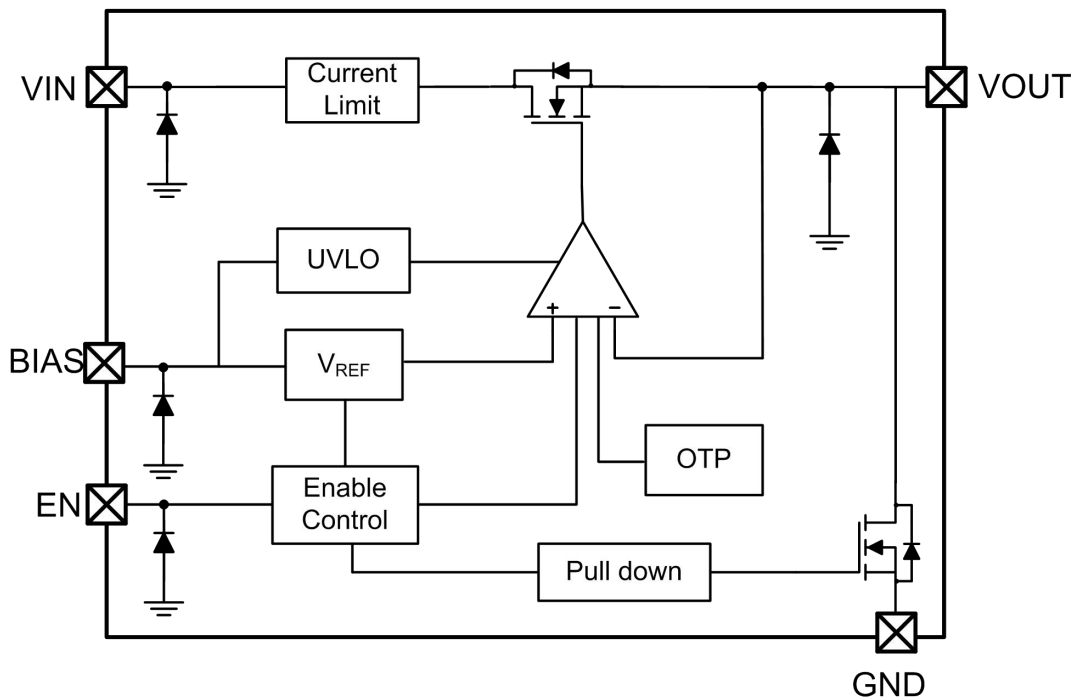
Marking

ORDER INFORMATION

For detail order information, please see page 9.

Typical Application

Pin Description
DFN1212-4L

PIN	Symbol	Description
1	VOUT	Output
2	BIAS	Bias voltage supply for internal control circuits
3	EN	Enable (Active high)
4	VIN	Input Voltage Supply pin
5	GND	Ground

Block Diagram


Absolute Maximum Ratings

Parameter	Value	Unit	
V _{IN} Range	-0.3~6.0	V	
V _{BIAS} Range	-0.3~6.0	V	
V _{EN} Range	-0.3~V _{IN}	V	
V _{OUT} Range	-0.3~V _{IN}	V	
I _{OUT}	600	mA	
Lead Temperature Range	260	°C	
Storage Temperature Range	-55 ~ 150	°C	
Moisture Sensitivity Level	Level-1		
Operating Junction Temperature	150	°C	
ESD Ratings	HBM	6000	V
	MM	300	V

Recommend Operating Ratings

Parameter	Value	Unit
Operating Supply voltage	2.4~5.5	V
Operating Temperature Range	-40~85	°C
Operating Junction Temperature Range	-40~125	°C
Thermal Resistance, R _{θJA} (DFN1212-4L)	170	°C/W

Electronics Characteristics

 1. $T_a=25^{\circ}\text{C}$, $V_{IN}=V_{OUT}+0.5\text{V}$, $C_{IN}=1.0\mu\text{F}$, $C_{BIAS}=0.1\mu\text{F}$, $C_{OUT}=2.2\mu\text{F}$, unless otherwise noted

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating VIN Voltage Range	V_{IN}		$V_{OUT}+$ V_{drop}		5.5	V
Operating BIAS Voltage Range	V_{BIAS}	$V_{OUT} \leq 1.0\text{V}$	2.4		5.5	V
		$V_{OUT} > 1.0\text{V}$	$V_{OUT}+1.4\text{V}$		5.5	V
Output Voltage accuracy	V_{OUT}	$I_{OUT}=1\text{mA}$	V_{OUT}^* 0.99	V_{OUT}	V_{OUT}^* 1.01	V
Current Limit	I_{LIM}	$V_{OUT}=90\%V_{OUT(NOM)}$	600			mA
Output Short Current	I_{SC}			190		mA
VIN Line Regulation	ΔV_{LINE}	$V_{IN}=V_{OUT}+0.5\text{V} \sim 5.5\text{V}$, $I_{OUT}=1\text{mA}$		0.1	5	mV
VBIAS Line Regulation	ΔV_{LINE}	$V_{BIAS}=2.7 \sim 5.5\text{V}$, $I_{OUT}=1\text{mA}$		0.1	5	mV
Load Regulation	ΔV_{Load}	$I_{OUT}=1 \sim 500\text{mA}$		30	70	mV
Quiescent Current	I_Q	$V_{BIAS}=2.7\text{V}$, $V_{OUT}=1.1\text{V}$, $I_{OUT}=0$		60	110	μA
Shut-down Current	I_{SHDN}	$V_{EN}=0\text{V}$			1.0	μA
Power Supply Rejection Rate		V_{IN} to V_{OUT} , $F=1\text{kHz}$, $I_{OUT}=10\text{mA}$. $V_{IN} > V_{OUT}+0.5\text{V}$		80		dB
		V_{BIAS} to V_{OUT} , $F=1\text{kHz}$, $I_{OUT}=10\text{mA}$. $V_{IN} > V_{OUT}+0.5\text{V}$		65		
EN logic high voltage	V_{ENH}	$V_{IN}=5.5\text{V}$, $I_{OUT}=1\text{mA}$	1.2			V
EN logic low voltage	V_{ENL}	$V_{IN}=5.5\text{V}$, $V_{OUT}=0\text{V}$			0.4	V
EN Input Current	I_{EN}	$V_{EN}=0$ to 5.5V			1.0	μA
Output Noise Voltage	e_{NO}	$V_{IN}=V_{OUT}+0.5\text{V}$, $V_{OUT(NOM)}=1\text{V}$, $I_{OUT}=10\text{mA}$, $f=10\text{Hz}$ to 100KHz		20		μV_{rms}
Thermal shutdown threshold	T_{SD}			160		$^{\circ}\text{C}$
Thermal shutdown hysteresis	ΔT_{SD}			20		$^{\circ}\text{C}$
Auto-discharge Nch Tr. ON Resistance	R_{LOW}	$V_{BIAS}=3.5\text{V}$, $V_{CE}=0\text{V}$		50		Ω

Dropout Voltage

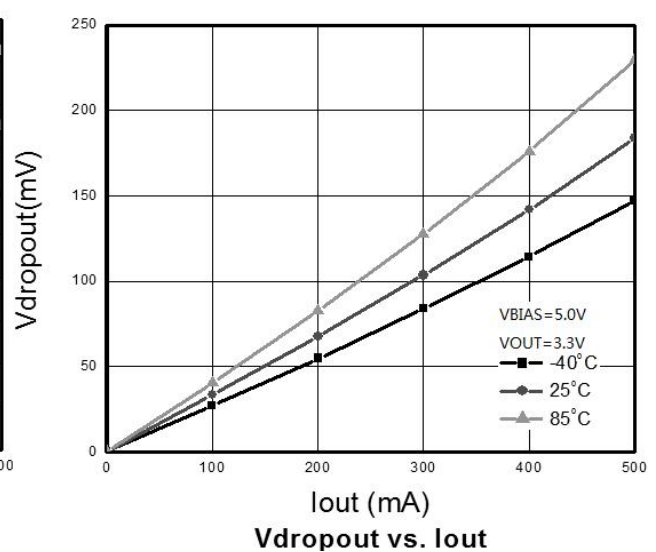
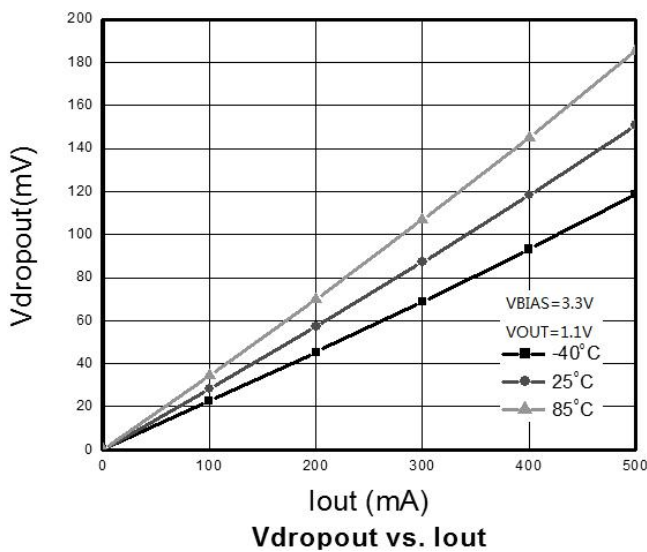
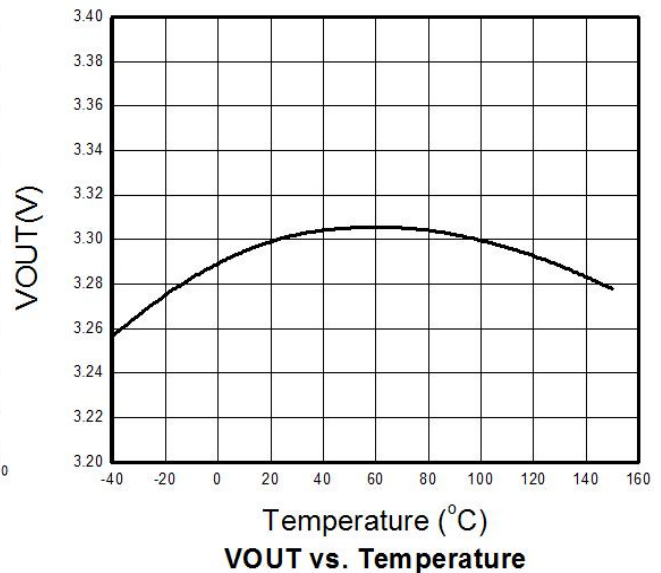
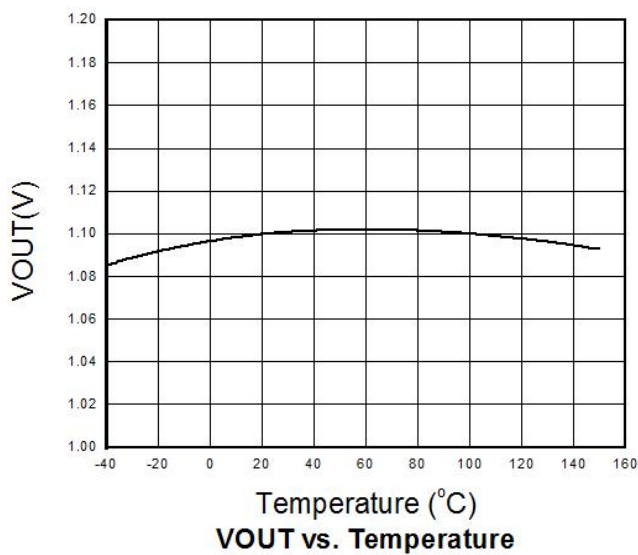
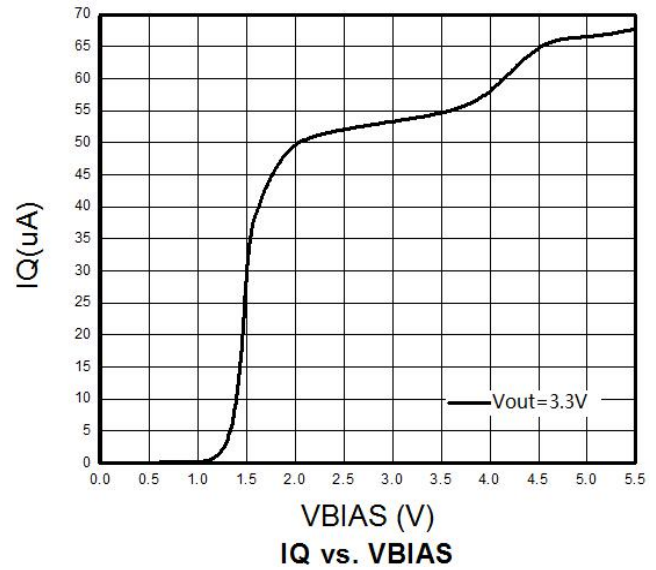
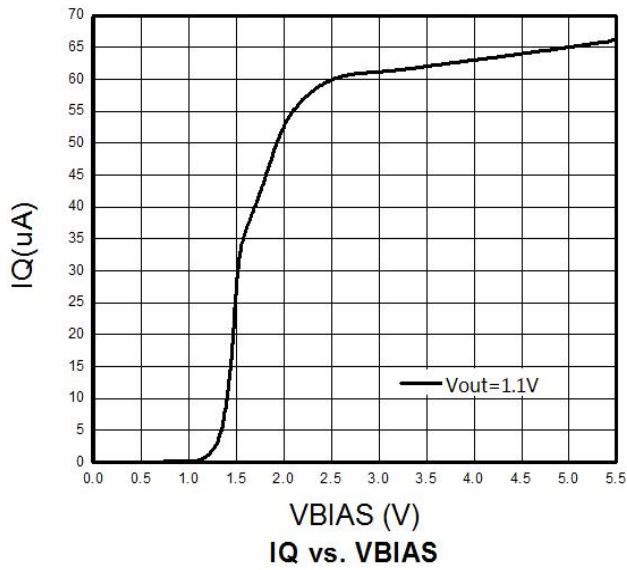
1. $T_a=25^{\circ}\text{C}$, $V_{\text{IN}}=V_{\text{OUT}}+0.5\text{V}$, $C_{\text{IN}}=1.0\mu\text{F}$, $C_{\text{BIAS}}=0.1\mu\text{F}$, $C_{\text{OUT}}=2.2\mu\text{F}$, unless otherwise note

2. The specifications with * are guaranteed by engineering at $-40^{\circ}\text{C} \leq T_a \leq 85^{\circ}\text{C}$

Parameter	Symbol	Condition						Unit
		$I_{\text{OUT}}=300\text{mA}$			$I_{\text{OUT}}=500\text{mA}$			
		Min	Typ	Max	Min	Typ	Max	
Output Voltages	V_{BIAS} input voltages							
$0.8\text{V} \leq V_{\text{OUT}} < 1.0\text{V}$	3.3V	—	100	150*	—	150	240*	mV
$1.0\text{V} \leq V_{\text{OUT}} < 1.2\text{V}$	3.3V	—	110	160*	—	160	240*	mV
$1.2\text{V} \leq V_{\text{OUT}} < 1.4\text{V}$	3.3V	—	120	170*	—	170	250*	mV
$1.4\text{V} \leq V_{\text{OUT}} < 1.6\text{V}$	3.3V	—	125	170*	—	180	260*	mV
$1.6\text{V} \leq V_{\text{OUT}} < 1.8\text{V}$	$V_{\text{OUT}}+1.7\text{V}$	—	130	180*	—	190	270*	mV
$1.8\text{V} \leq V_{\text{OUT}} < 2.1\text{V}$	$V_{\text{OUT}}+1.7\text{V}$	—	135	180*	—	195	280*	mV
$2.1\text{V} \leq V_{\text{OUT}} < 2.5\text{V}$	$V_{\text{OUT}}+1.7\text{V}$	—	135	190*	—	195	290*	mV
$2.5\text{V} \leq V_{\text{OUT}} < 3.3\text{V}$	$V_{\text{OUT}}+1.7\text{V}$	—	135	200*	—	200	300*	mV

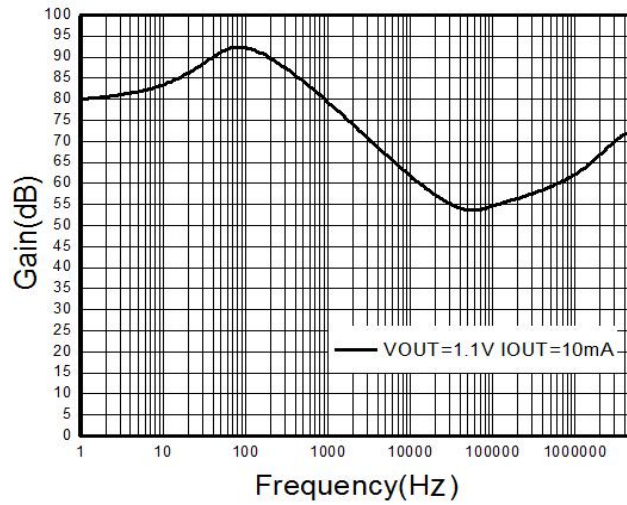
Typical characteristics

1. $T_a=25^\circ\text{C}$, $V_{IN}=V_{OUT}+0.5\text{V}$, $C_{IN}=1.0\mu\text{F}$, $C_{BIAS}=0.1\mu\text{F}$, $C_{OUT}=2.2\mu\text{F}$, unless otherwise noted



Typical characteristics

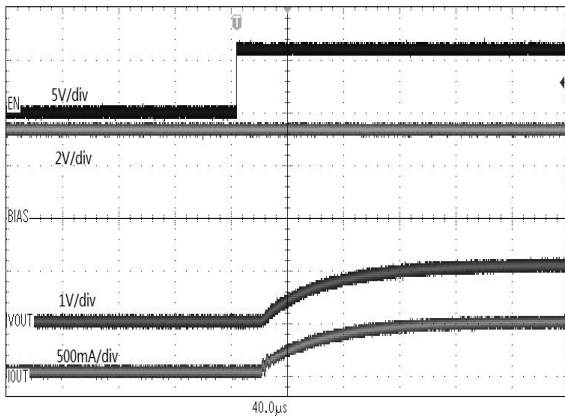
1. $T_a=25^{\circ}\text{C}$, $V_{\text{BIAS}}=5.0\text{V}$ $V_{\text{IN DC}}=V_{\text{OUT}}+1.0\text{V}$ $V_{\text{IN ac}}=500\text{mV}-V_{\text{p-p}}$ $V_{\text{CIN}}=\text{none}$, $C_{\text{BIAS}}=0.1\mu\text{F}$, $C_{\text{OUT}}=2.2\mu\text{F}$



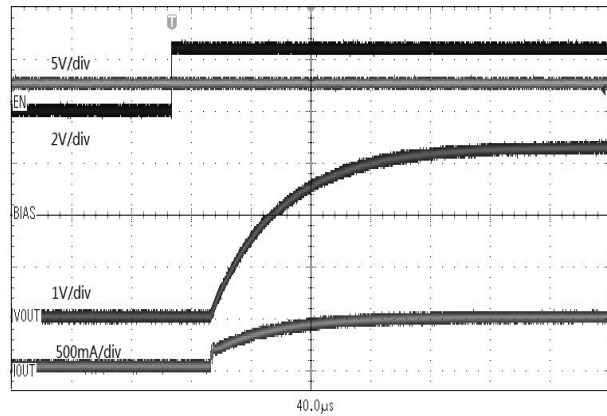
Start-up From EN

1. $T_a=25^{\circ}\text{C}$, $V_{\text{IN}}=V_{\text{OUT}}+0.5\text{V}$ $C_{\text{IN}}=1.0\mu\text{F}$, $C_{\text{BIAS}}=0.1\mu\text{F}$, $C_{\text{OUT}}=2.2\mu\text{F}$, unless otherwise noted

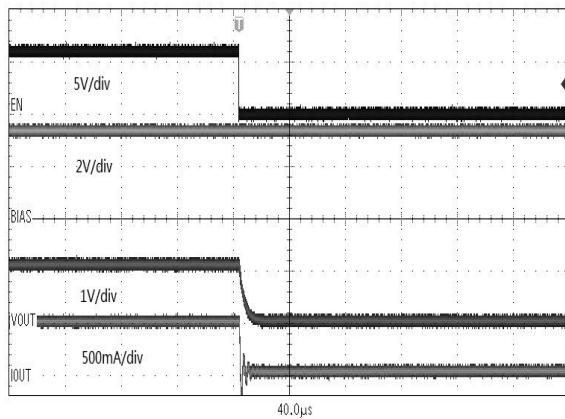
VOUT=1.1V EN ON



VOUT=3.3V EN ON



VOUT=1.1V EN OFF



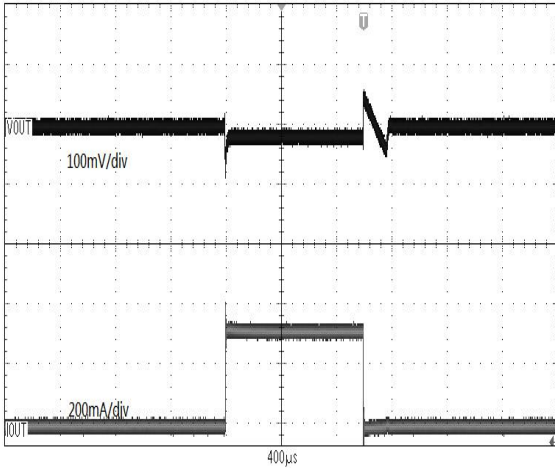
VOUT=3.3V EN OFF

Load Transient Response

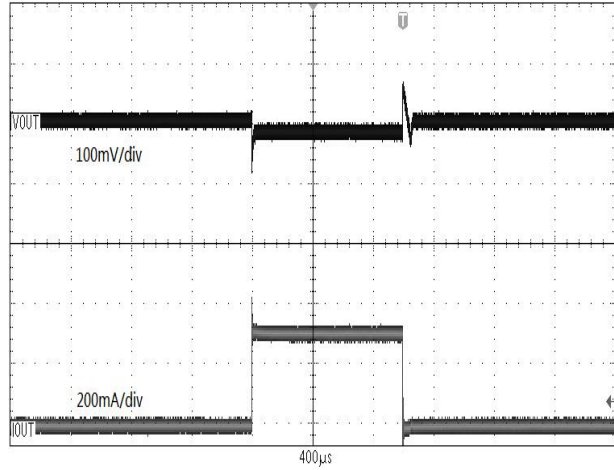
1. $T_a=25^\circ\text{C}$, $V_{IN}=V_{OUT}+0.5\text{V}$, $C_{IN}=1.0\mu\text{F}$, $C_{BIAS}=0.1\mu\text{F}$, $C_{OUT}=2.2\mu\text{F}$, unless otherwise noted)

2. $T_r=T_f=1\mu\text{s}$

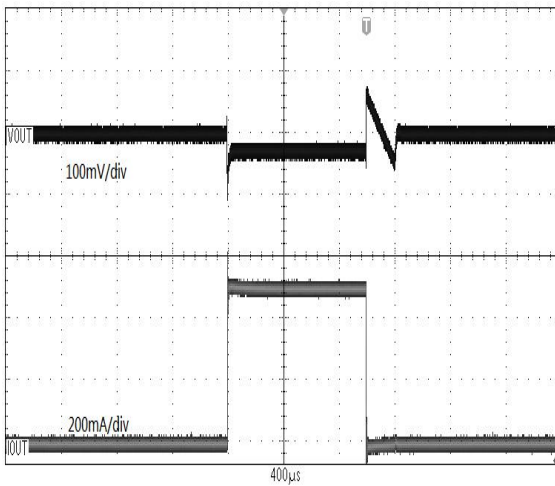
$V_{OUT}=1.1\text{V}$ 1mA→300mA→1mA



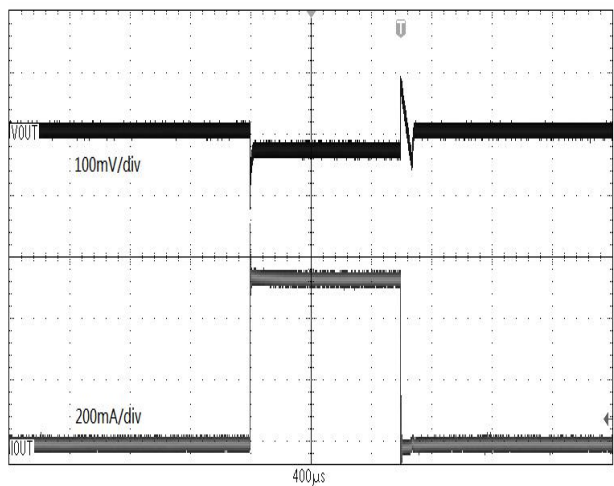
$V_{OUT}=3.3\text{V}$ 1mA→300mA→1mA



$V_{OUT}=1.1\text{V}$ 1mA→500mA→1mA



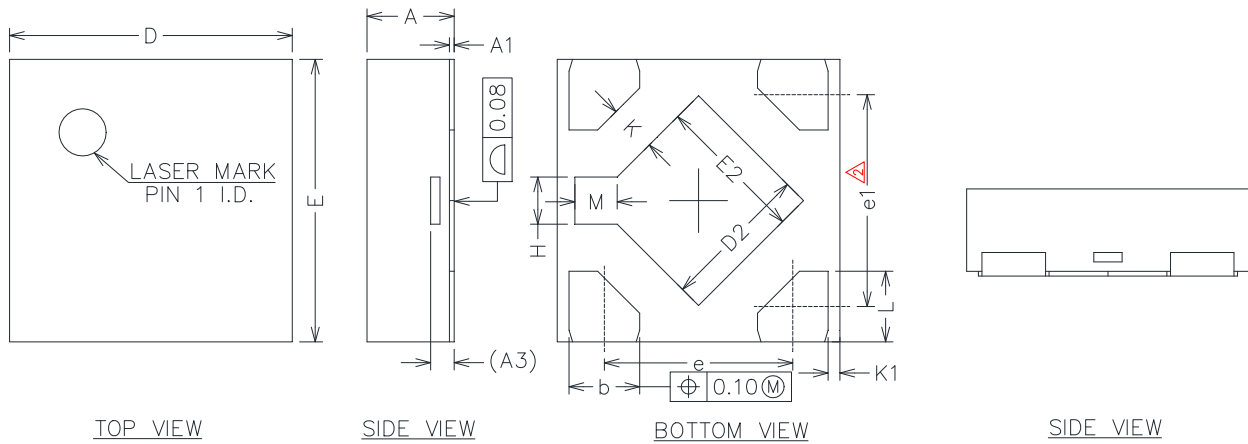
$V_{OUT}=3.3\text{V}$ 1mA→500mA→1mA



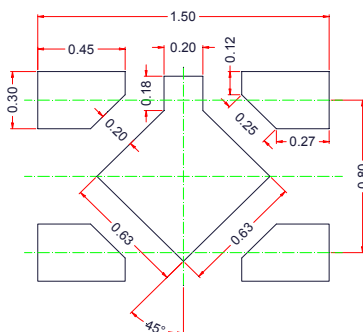
ORDER INFORMATION

Ordering No.	Vout (V)	Package	Operating Temperature	Marking	Shipping
WL2831D09-4/TR	0.9	DFN1212-4L	-40~+85°C	D*	Tape and Reel, 3,000
WL2831D10-4/TR	1.0	DFN1212-4L	-40~+85°C	C*	Tape and Reel, 3,000
WL2831D105-4/TR	1.05	DFN1212-4L	-40~+85°C	H*	Tape and Reel, 3,000
WL2831D11-4/TR	1.1	DFN1212-4L	-40~+85°C	A*	Tape and Reel, 3,000
WL2831D12-4/TR	1.2	DFN1212-4L	-40~+85°C	G*	Tape and Reel, 3,000
WL2831D33-4/TR	3.3	DFN1212-4L	-40~+85°C	B*	Tape and Reel, 3,000

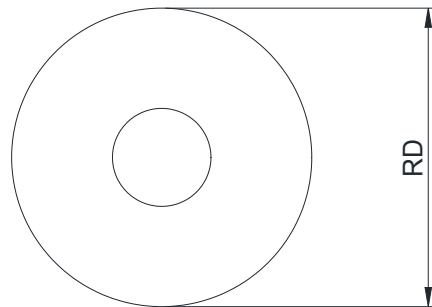
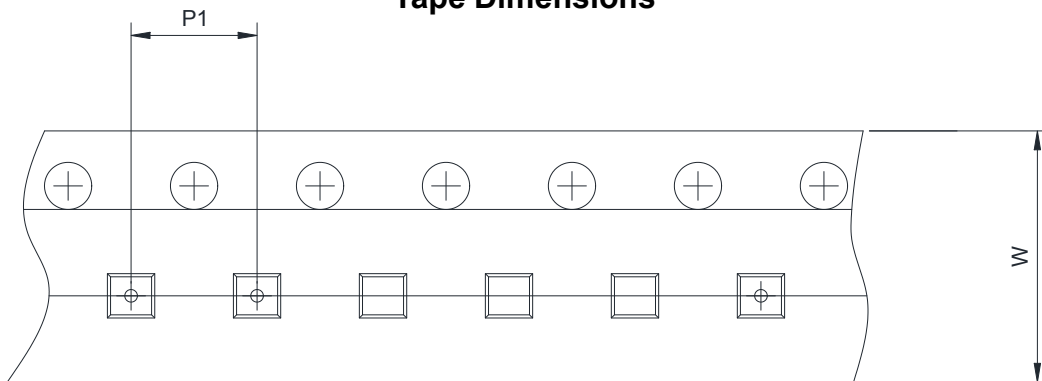
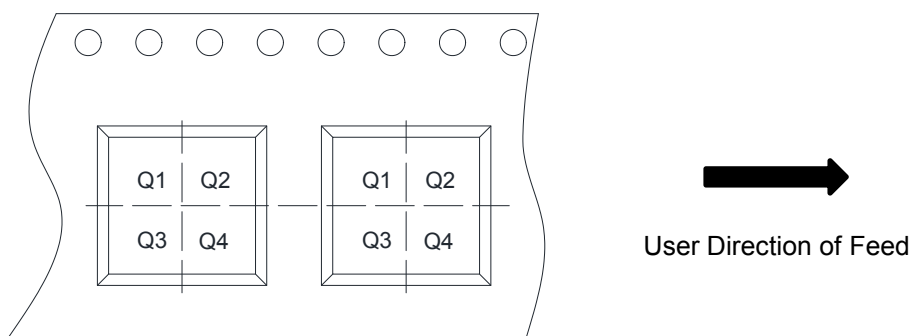
Marking:
X: Voltage Code
*** : Month Code**

PACKAGE OUTLINE DIMENSIONS
DFN1212-4L


Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.34	0.37	0.40
A1	0.00	0.02	0.05
A3	0.10 Ref.		
b	0.25	0.30	0.35
L	0.25	0.30	0.35
D	1.15	1.20	1.25
E	1.15	1.20	1.25
D2	0.58	0.63	0.68
E2	0.58	0.63	0.68
e	0.75	0.80	0.85
e1	0.80	0.90	1.00
H	0.15	0.20	0.25
M	0.13	0.18	0.23
K	0.15	-	-
K1	0.00	0.05	0.10

Recommend land pattern (Unit: mm)

Notes:

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape


RD	Reel Dimension	<input checked="" type="checkbox"/> 7inch	<input type="checkbox"/> 13inch		
W	Overall width of the carrier tape	<input checked="" type="checkbox"/> 8mm	<input type="checkbox"/> 12mm		
P1	Pitch between successive cavity centers	<input type="checkbox"/> 2mm	<input checked="" type="checkbox"/> 4mm	<input type="checkbox"/> 8mm	
Pin1	Pin1 Quadrant	<input checked="" type="checkbox"/> Q1	<input type="checkbox"/> Q2	<input type="checkbox"/> Q3	<input type="checkbox"/> Q4